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Null pronouns in Russian embedded clauses

Philip Shushurin[1]

Abstract.

While matrix clauses pronouns are almost never dropped in Russian, null pronouns are licensed in almost all kinds of embedded clauses. Null pronouns in such positions share similarities with PRO, but they also differ from PRO in many respects. In this paper, I show that there are two kinds of environments in which such pronouns can appear. The first kind of environment includes complements of attitude verbs, where there is strong evidence for a syntactic relation between the null pronoun and its antecedent. In the second kind of environment, which includes sentential adjuncts and embedded wh-questions, the nature of this relation seems to be different. I propose that Russian possesses a minimally specified silent pronoun which is phonologically deficient and must cliticize onto a higher projection and thus can only be found in the presence of an overt complementizer. I adopt the idea proposed in Holmberg (2005) that a major feature of pro-drop phenomena is the valuation of the D feature of the null pronoun. I propose that in Russian the null pronoun is unable to value this feature inside the clause where it is merged and therefore needs to probe outside the clause to get the D feature valued. The difference between properties of silent pronouns in the two kinds of environments is derived from the exact mechanism by which the valuation takes place. In the case of complements of attitude verbs, the valuation takes place as a result of an agree relation, in other cases the valuation takes place via a topic-chain.

1. Introduction

Russian has been described as a non-pro-drop language, (e.g. Franks 1995, Fehrmann & Junghanns 2008). Indeed, in most cases the pronoun in the subject position is obligatory, as the following example shows. Russian can therefore be contrasted with languages like Italian where the subject of the matrix can be easily omitted as long as it can refer to a salient referent in the discourse. However, in many embedded clauses, Russian allows the optional omission of the subject pronoun:

(1) Boris$_i$ skazal, čto (on_i) pridët
Boris said that he will.come
'Boris said that he would come.'

To account for this difference in the availability of null pronouns in matrix and embedded clauses in Russian, previous research (e.g. Livitz 2014, Tsedryk 2012) has proposed that a special syntactic relation holds between the null pronoun and its antecedent in sentences like (1), which makes the licensing of a null pronoun possible. Such a proposal is largely justified: there is strong evidence for the syntactic nature of this relation in such sentences. When a clause is embedded under the verb *skazat'* 'say' - or any other attitude verb, the relation between the

[1] Philip Shushurin
New York University
10 Washington Place
New York, NY10075, USA
e-mail: ps3117@nyu.edu

silent pronoun and its antecedent must be strictly local, and the silent pronoun is construed as a bound variable. Since many properties of null pronouns resemble those of PRO, some researchers have tried to reduce the phenomena in question to finite control (Tsedryk 2012).
However, these PRO-like properties do not hold for all pronouns in embedded clauses. As example (2) shows, in some cases a silent pronoun may be contained within a clause which is separated from its syntactic antecedent by more than one clause boundary, (2) exists is in sharp contrast to constructions like (3), where the antecedent cannot be farther than one clause away from the silent pronoun:

(2) Miša$_i$ uznal, [čto nužno delat' [kogda (on) pridët domoj]]
Misha learnt what necessary do.INF when he come.FUT home
'Misha has learnt what is to be done when he comes home'

(3) Saša$_i$ dumaet, [čto eto xorošo, [čto *(on$_i$) ne budet žit' odin]]
Sasha thinks that this good that he NEG FUT live.INF alone
'Sasha thinks that it's good that he won't live alone'

Under further scrutiny, some other important differences between cases like (2) and cases like (3) can be found. For instance, in the former case the silent pronoun contained in the embedded clause is not bound. Yet, there are important similarities between the two cases which makes totally independent accounts of these facts undesirable. I argue that although differences between those two cases are significant we deal with the same pronoun in both cases.
I propose that the subject position in both (2) and (3) is occupied by a minimal pronoun which gets its D feature valued by either agreeing with its antecedent or by entering a topic chain. This difference in the valuation of the D feature results in different properties of these two cases. The pronoun is also assumed to be a clitic that needs an adjacent, phonologically overt host; this accounts for the fact that null pronouns in Russian almost universally occur in the vicinity of complementizers.
The rest of the paper is organized as follows. In section 2, I provide a list of properties exhibited by null pronouns when embedded under attitude verbs. These properties support the claim and made in previous research (e.g. Livitz (2014), Tsedryk (2012)), that silent pronouns found under attitudes are in a syntactic relation with their syntactic antecedent in the matrix clause. Section 3 lists the differences between silent pronouns found under attitudes and those found elsewhere, concluding that they must be considered two separate subclasses of null pronouns. In section 4, I review critically the possibility that null pronouns in attitude contexts can be reduced to PRO and show that such reduction would be problematic In section 5, I propose a unified analysis for both silent pronouns found under attitudes and silent pronouns found in other environments. In section 6, I explore an implication my analysis might have; section 7 concludes the paper.

A short note on definitions and abbreviations: I will refer to Null Pronouns in Embedded Clauses as NPEC; more specifically, to null pronouns found in the complements of attitude verbs as ATT-NPEC and to NPEC found in other positions as Less Local NPEC (LL-NPEC).

2. NPECs under attitudes are bound with their antecedent via a syntactic relation

In Russian same-subject complement clauses embedded under an attitude verb can – in most cases (some exceptions are discussed below)– be introduced in two ways: with an overt subject (4) or with a silent subject (5), which I will notate as '_':

(4) Nina skazala, čto ona pridët
Nina said that she will.come
'Nina said that she would come'

(5) Nina$_i$ skazala, čto _$_i$ pridët
Nina said that will.come
'Nina said that she would come'

These facts have been discussed several times in the literature, e.g. (Livitz 2014, Tsedryk 2012), with the main conclusion being that despite the minimal difference, the sentences (4) and (5) have different structures. For example, Livitz (2014) addresses these facts and proposes that the silent pronoun enters an agree relation with its syntactic antecedent, while Tsedryk (2012) proposes a movement relation between them. In this section I will show that although these authors' main conclusion is correct – the relation between the null pronoun and its antecedent in (5) is indeed syntactic and thus different from (4) – their description of null pronouns is only partially correct.

For example, Livitz (2014) observes, that unlike their overt counterparts, silent pronouns are referentially dependent. A silent pronoun can only refer to the subject of the matrix clause, while overt pronouns are more free in reference. Thus, in example (6) the pronoun *ona* 'she' can refer to an individual other than Nina – the subject of the matrix clause – while the silent pronoun cannot, as the example (7) shows:

(6) Nina$_i$ skazala, čto ona$_j$ pridët
Nina said that she will.come
'Nina$_i$ said that she$_j$ would come'

(7) *Nina$_i$ skazala, čto _$_j$ pridët
Nina said that will.come
'Nina$_i$ said that she$_j$ would come'

Livitz also correctly observes that NPECs must be (i) c-commanded by their antecedents and (ii) have an antecedent in the next clause up. The former condition prohibits configurations like (8) where the NPEC is not c-commanded by its antecedent, the DP *prezidenta*. The latter condition prohibits the null pronoun in the lowest clause in example (9) from referring to the potential antecedent *Petja*, - which is more than one clause away from it.

(8) *[Doč' prezidenta]$_j$ ob"javila [čto _$_j$ vystupit s dokladom]
daughter president.GEN announced that will-perform.3SG with speech
'The president's daughter announced that she will give a speech.'
(Livitz 2014:72)

(9) *Petja skazal [čto Masha podumala [čto *(on) ploxo igral v futbol]]
Petja said that Maša thought.SG.FEM that (he) badly played.SG.MASC in soccer

'Petja thinks that Masha said that he plays soccer badly[2]'

As for the properties of the clause itself, Livitz remarks that apart from the matrix predicate '*say*' overt pronouns may alternate with covert ones in "a range of matrix embedding predicates, including *think*, *promise*, *forget*, and *insist*" (Livitz 2012:69)
These conditions can be summarized as follows:

(10) Null pronouns are licensed in complements of the verb 'say' and a range of other embedding predicates only if it has a c-commanding antecedent in the next clause up.

The dependence of the null pronoun on the properties of the embedding predicate, its sensitivity to c-command and its semantic boundness strongly indicate that we are dealing with a syntactic relation. However, the generalization in (10) appears not to be entirely accurate. I will show that these conditions have not been stated correctly and that null pronouns exhibit other properties that have not been reported in the literature. However, this data does not undermine the evidence for a syntactic account of licensing silent pronouns in Russian.
First of all, when embedded under directive predicates, such as *say*, *order* etc., null pronouns can have a dative object as a syntactic antecedent.

(11) Ja$_i$	skazal	jemu$_j$,	[čtoby	_$_j$	prixodil	poskoree]	
I	said	him.DAT	SUBJ		came	soon	

'I told him to come soon'

Unlike all other NPECs that we have seen so far, the addressee-oriented NPECs must be contained in a subjunctive complement. However, apart from this difference, other properties of such sentences are similar to those of ATT-NPEC. Thus, in this case NPEC must be c-commanded by its antecedent. Sentence (12), in which the antecedent is more than one clause away, and sentence (13), in which the NPEC is not c-commanded by its antecedent, are both ungrammatical:

(12) *Dima$_i$	rasporjadilsja,	[čtoby	bylo	objavleno,	[čtoby	_$_i$		
Dima	made.arrangements	SUBJ	was	declared	SUBJ	he		
pokinul	stranu]]							
left	country							

'Dima$_i$ saw to it that it was publicly declared that he$_i$ should leave the country'

(13) *Dima	skazal	[otcu	Kirilla$_i$],	čtoby	_$_i$	prixodil	poskoree
Dima	said	father.DAT	Kirill.GEN	SUBJ		came	soon

[2] The example (9), however, is not sufficiently informative. One could argue that in such cases the silent pronoun is unavailable because a more local potential antecedent, 'Masha', in this case is an intervener. For this reason, we have to check cases where no potential intervener is present:

Saša$_i$	dumaet,	čto	eto	xorošo,	čto	*(ona$_i$)	ne	budet	žit'	odna
Sasha	thinks	that	this	good	that	she	NEG	FUT.3SG	live.INF	alone

'Dima told Kirill's father to come soon'

In addition to that, the null pronoun is construed as a bound variable, since the ellipsis resolution allows only sloppy readings:

(14) Dima$_i$ skazal svoemu otcu$_j$, [čtoby _$_j$ prixodil poskoree], i Nina tože[3]
Dima said his father.DAT SUBJ came soon and Nina too
'I told him to come soon'

We will take this as evidence that null pronouns in sentences like (7) and the null pronouns in sentences like (11) are of the same nature.
Another potential problem for the generalization in (10) is the fact that silent pronouns can be contained in adjuncts, as in (15):

(15) Marina$_i$ budet zavtra uvolena [potomu čto (ona$_i$) často otsutstvuet na rabote]
Marina FUT tomorrow fired because she often is.absent on work
'Marina will be fired tomorrow because she is often absent from office'

If (15) is a sentence of the same kind as the ones containing silent pronouns in complements of attitude verbs, then the question arises why locality is respected in some cases and not in others. If, on the other hand, these are two different types, one may wonder what the exact distribution of each type is.
In the next section I will show that null pronouns in sentential adjuncts differ systematically in their properties from ATT-NPECs, although they also show some important similarities. Moreover, I will show that null pronouns of embedded wh-complements pattern with LL-NPECs. I will also show that taken together, NPEC can be used in any embedded clause, as long as the clause contains an overt complementizer and the finite verb in the embedded bears inflection.

3. Local NPEC vs ATT-NPEC

As we have seen, silent pronouns can be licensed in sentential adjuncts:

(16) Marina$_i$ budet zavtra uvolena [potomu čto (ona$_i$) často otsutstvuet na rabote[4]]
Marina FUT tomorrow fired because she often is.absent on work
'Marina will be fired tomorrow because she is often absent from office.'

This is also true for all relative clauses, as the following example shows:

(17) Marina$_i$ razbila vazu, [kotoruju (ona$_i$) kupila nakanune]
Marina broke vase which she bought the.previous.day
'Marina broke the vase which she had bought the previous day.'

[3] I take Gribanova's (2012) position that such constructions indeed are instances of ellipsis. See, however, (Bailyn 2014) for the opposite view.
[4] In sentences where sentential adjuncts bear the same tense value as the matrix clause NPEC exhibit different properties. I don't have a satisfactory account for this contrast.

In this section I will show that the NPECs in these environments exhibit different properties compared to ATT-NPECs: LL-NPEC may have an antecedent more than one clause away, are not bound variables, and can only have a nominative antecedent.
Let's start with locality constraints. LL-NPECs do not respect the locality condition, e.g. the antecedent can be more than clause away from its antecedent, as the following examples show:

(18) Miša$_i$ uznal, [čto nužno delat' [kogda _$_i$ pridët domoj[5]]]
Misha learnt what necessary do.INF when come.FUT home
'Misha found out what was to be done when he came home'

(19) Saša$_i$ ne znaet [čto delat' s vazoj [kotoruju
Sasha NEG knows what do.INF with vase which

_$_i$ nakanune polučil v podarok]]
the.day.before got in gift
'Sasha doesn't know what he should with the vase that he got as a present the day before'

This is not only true for silent pronouns in sentential adjuncts. Silent pronouns are also licensed in embedded wh-questions and share the same properties (see 20), and in these environments silent pronouns show the same properties:

(20) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen]
Misha tomorrow will.learn where was enrolled
'Misha will learn tomorrow when he was enrolled

The sentence below shows that a silent pronoun in an embedded wh-question can have an antecedent more than one clause away from it.

(21) Miša$_i$ byl rasstroen poskol'ku neozhidanno vyjasnilos'
Misha was upset because suddenly became.clear

skolko vremeni _$_i$ budet provodit' na rabote
how.much time FUT spend on work

'Misha was upset because it suddenly became clear how much time he would spend in the office.'

The next examples demonstrate that in all cases NPECs are not bound variables. In the (22), VP-ellipsis in a wh-complement with a NPEC in the subject position allows strict readings (in the sense of (Morgan 1970))

(22) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen], i Nina tože

[5] One might argue that it is the implicit subject *emu* he.DAT which is the antecedent of the NPEC. The following example, however, shows that it cannot be the case:
*Miše$_i$ neizvestno, [čto nužno delat' kogda _$_i$ pridët domoj]
Misha.DAT learnt what necessary do.INF when come.FUT home
'Misha doesn't know what is to be done when he comes home'
This sentence is minimally different in that the antecedent in the matrix clause is marked with dative instead of nominative. The sentence is ungrammatical which suggests that this DP is indeed the syntactic antecedent, (as well as that the antecedent of NPEC in such cases must be nominative subjects).

Misha tomorrow will.learn where was enrolled and Nina too
'Misha will learn tomorrow when he was enrolled and so will Nina'

(23) shows that a NPEC in wh-complements cannot be bound by a quantifier and thus cannot be a bound variable.

(23) *[Každyi rabotnik etogo otdela] budet zavtra uvolen
every employee this.GEN department.GEN FUT tomorrow fired

[potomu čto _i často otsutstvuet na rabote]
because often is.absent on work
'Every employee of this department will be fired tomorrow because he/she is frequently absent from the office'

Finally, unlike ATT-NPECs, NPECss of this type always have a nominative antecedent.

(24) Dime prišlos' segodnja mnogo rabotat'
Dima.DAT had.to today much to.work

[poetomu *(on) uže spit]
that's.why he already sleeps

'Dima had to work much today, that's why he is already sleeping.'

In this case, the antecedent of the NPEC is a dative argument, and the sentence is ungrammatical. This is also true for every other sentence where a LL-NPEC has a dative antecedent.

We have seen that, on one hand, silent pronouns in adjuncts and in embedded wh-questions form a natural class and, on the other hand, less local NPECs are different from NPECs under attitudes in at least three respects: they cannot have non-nominative antecedents, they cannot be construed as bound variables and they are not subject to the locality constraints. This suggests, that different cases of pro-drop in embedded clauses in Russian do not constitute a homogenous class and the two cases must be dealt with separately.
The fact that NPECs are licensed both in sentential adjuncts and in sentential complements means that there is no major class of embedded contexts where silent pronouns are impossible. In other words, any kind of an embedded clause can potentially contain NPECs given that other licensing conditions are met.
Let us now spell out once more what we have seen so far. Russian allows silent pronouns in embedded clauses which show different properties in different configurations. When contained in a complement of an attitude verb, NPECs require a strictly local antecedent, are construed as a bound variable and can have a dative or a nominative antecedent. In all other embedded environments, NPECs may have a less local antecedent, are not bound variables and can only have nominative antecedents.

These properties are summarized in Table 1.

Table 1.

	Distribution	Locality	Boundness	Dative antecedents
ATT-NPEC	[non-wh] complements of attitude verbs	yes, must have in a strictly local antecedent (no more than one phase boundary)	yes	yes, under directive verbs
LL-NPEC	wh-complements; adjuncts	locality conditions are more lax	no	no

Nonetheless, there is evidence that these two phenomena are not completely unrelated. Apart from the trivial fact that both kinds of pronouns are licensed in embedded clauses, there are at least two properties in which ATT-NPEC and LL-NPEC are similar: dependence on overt complementizers and a ban on null copulas.

Let's consider each requirement in more detail. In Russian, present tense copular have no overt copula. In these cases the null subject in an embedded clause is not possible although minimally different sentences with an overt pronoun are grammatical. This holds for both ATT-NPECs (25) and LL-NPECs (26):

(25) Vova$_i$ skazal, [čto *(on$_i$) student]
Vova said that he student
'Vova said that he was a student'

(26) Vova budet uvolen, potomu čto *(on) samyj ploxoj rabotnik
Vova FUT fired because he most bad employee
'Vova will be fired because he is the worst employee'

The example below shows that licensing conditions cannot be attributed to lexical properties of a verb. In the past tense where the copula is overt, an NPEC is licensed:

(27) Dima znaet, čto byl studentom
Dima knows that was student.INSTR
'Dima knows that he was a student[6]'

An interesting contrast can be found between sentences with long adjectives and short adjectives in the predicate position. While clauses with long adjectives in the position of a nominal predicate don't allow null pronouns (29), those that contain short adjectives in that position do, see (28). This pattern can be easily explained if one takes Bailyn's (1994) view on

[6] This sentence is not strictly speaking a minimal pair to (27) since the noun in the predicate position bears instrumental case, unlike its counterpart in the sentence (25), where it is marked with nominative case. However, I see no conceivable way how this difference might relate to the licensing of the silent pronoun.

the long/short adjective distinction, according to which clauses with long adjectives contain a copula, while in sentences with short adjectives the short adjective is in the finite verb position and hence the sentence contains no copula:

(28) Vova$_i$ skazal, čto (on$_i$) bogat
Vova said that he rich.SF
'Vova said he was rich' (SF)

(29) Vova$_i$ skazal, čto *(on$_i$) bogatyj
Vova said that he rich.LF
'Vova said that he was rich' (LF)

Based on this evidence, I assume that NPECs are sensitive to the presence of inflectional morphology. Indeed, the null copula is the only form in all paradigms of Russian verbs which doesn't bear inflection. I will show in section 4 how this assumption can be implemented.
The second property that both LL-NPECs and ATT-NPECs share is the obligatoriness of an overt complementizer in the embedded clause. In sentence (32) where the complementizer is not superficially present due to complementizer drop which would be possible in that configuration if the subject was overt (31), NPEC in this sentence is not allowed. If the complementizer is overt, however, as in (30), the null pronoun is possible:

(30) Dima$_i$ skazal, [čto _$_i$ zajdët večerom]
Dima said that will.come.over in.the.evening

(31) Dima$_i$ skazal, [on$_i$ zajdët večerom]
Dima said he will.come.over in.the.evening

(32) *Dima$_i$ skazal,[_$_i$ zajdët večerom]
Dima said will.come.over in.the.evening

'Dima said that he would come over in the evening'

The dependence of LL-NPEC on the overtness of the complementizer is harder to test since complementizers in adjuncts usually don't drop. However, there is one complementizer licensed in non-complement environments that can drop[7], viz. the complementizer *to* 'then' of conditional constructions. As (33) shows, this complementizer is used in matrix rather than embedded clauses. However, the pattern is the same: when the complementizer is overt, the null pronoun is licensed; - when it is not, the null pronoun cannot be used:

(33) [Jesli on$_i$ dejstvitel'no idët po toj ulice]
If he really walks along that street

*(to) _$_i$ skoro uvidit stanciju
then soon will.see station

'If he is really walking that street then he'll see the station soon'

[7] I take no stand on whether in comp-less cases there is no complementizer or whether it is null. This doesn't matter for given purposes since, as I will propose in section 5, the condition on the presence of a complementizer is phonological.

This means that null pronouns can be licensed in environments other than embedded clauses. Moreover, it suggests that for LL-NPECs the embeddedness of the clause in which it is contained is not the crucial condition. The fact that null pronouns are almost universally found in embedded clauses is due to the fact that complementizers almost always appear in embedded clauses. In section 4 I will argue that LL-NPECs are bound with their antecedent via a discourse relation, meaning that structural relations do not play an important role in those cases. In summary, I propose that the relevant constraint governing the distribution of null pronouns must be the following:

(34) Null pronouns are licensed if they are adjacent to an overt complementizer (given that other conditions are met).

We have seen that while the two types of NPEC in Russian have quite different properties in different contexts, they also share some important similarities. ATT-NPECs are bound by a syntactic relation with its antecedent. LL-NPECs are not bound variables and are not subject to such strict locality restrictions. Despite these differences, ATT-NPEC and LL-NPEC share two important similarities; they require an overt complementizer and are not allowed in sentences with a null copula.
In the next section we turn to reviewing analyses of NPEC and show that neither NPECs as a whole group nor ATT-NPECs in particular can be reduced to PRO.

4. Against the control analyses of ATT-NPEC

As we have seen in the previous chapter, null pronouns in embedded clauses in Russian do not form a uniform class but fall into (at least) two major categories. This distinction has never been made in the literature, to my knowledge, even though null pronouns in embedded clauses as a whole have been studied in many works. This is likely because the examples that researchers discuss in their consideration of null pronouns are almost universally ATT-NPECs[8]. Consequently, theories that researchers propose for NPECs in Russian are designed to capture the syntactic nature of ATT-NPECs, and I will consider the theories which are (implicitly) assumed to account for all instances of null pronouns in embedded clauses as theories of ATT-NPEC.
One especially persistent intuition found in many works is that the relation between the null pronoun and its antecedent found in sentences with ATT-NPEC can be reduced to control. Indeed, similarities between ATT-NPEC and PRO are significant and difficult to ignore: the embedded and referentially dependent pronoun is null, just as most instances of PRO; in ATT-NPEC sentences there is a syntactic relation between a null pronoun and the superordinate clause and, the null pronoun is always a subject and is construed as a bound variable, as in controlled constructions.
In this section I will discuss these proposals and show that not only these particular analyses fail to account for the data adequately, but also that NPEC-phenomena cannot be reduced to control. To put it once again, I will consider only ATT-NPEC, although the distinction between

[8] To the authors' defense, it must be said that LL-NPEC are somehow less salient in the language, at least in the formal register. Some speakers judge sentences with LL-NPEC as belonging to colloquial register although sentences with ATT-NPEC seem to never be judged so. However, stylistic differences must be subtle, since LL-NPEC are found in abundance in written documents. I leave sociolinguistic and quantitative inquiries of NPEC-phenomena for future work.

ATT-NPEC and LL-NPEC is not articulated in any of these works. I will consider two most articulate accounts of NPEC sentences up to date: Livitz (2014) and Tsedryk (2012).

In his 2012 paper Tsedryk proposes that NPEC phenomena can be reduced to finite control. The work is written in the Movement Theory of Control (although the author considers the possibility that control can involve agree derivation in other cases (Tsedryk 2012:40)), and assumes that the controlled subjects and their antecedents are connected by a movement relation. Tsedryk correctly observes that NPEC bear many similarities with controlled subjects. Thus, they must be local, they are construed as bound variables and they are subject to locality conditions. Tsedryk assumes that the null pronoun and its antecedent are connected via an A-movement relation. The pronoun moves to the matrix clause to receive a theta-role and to agree with the matrix T.

This, in the author's view, accounts for the locality condition since A-movement must be local. The boundness of silent pronouns is derived in the same spirit: it is assumed that traces are always bound variables.

While this proposal suffers from certain conceptual issues (such as the idea that the same syntactic element can be case-marked twice, although with the same case value) I will put them aside and argue that Tsedryk's system does not account for the empirical facts.

First of all, the system predicts that the NPECs and their antecedents may not bear different cases from one another: as the author himself remarks, in such constructions one and the same element is case-marked twice, which is assumed to be impossible.

As we have seen in section 2, however, this generalization is wrong: NPECs can have dative antecedents:

(40) Ja skazal jemu$_j$, [čtoby _$_j$ prixodil poskoree]
I said him SUBJ came soon
'I told him to come soon'

Secondly, Tsedryk's system fails to account for the overt complementizer condition. There is nothing in Tsedryk's system that would prevent such structures as in (35):

(35) *Dima$_i$ skazal, _$_i$ [zajdët večerom]
Dima said will.come.over in.the.evening
'Dima said that she would come over in the evening'

Finally, if one adopts the movement approach, it is not clear what the status of LL-NPECs in this system should be. LL-NPEC are found in island environments, for instance, in adjuncts, and the movement derivation of such sentences is problematic. We could argue, of course, that LL-NPEC involve a completely different derivation. Such position is not impossible, of course, but is quite undesirable. Moreover, it is quite suspicious that two different phenomena share some important common properties: reliance on the overt complementizer and the constraint on null copulas.

Another work in which NPEC-phenomena are claimed to be control constructions is Livitz (2012), who observes that in Russian overt pronouns are in free variation with their silent counterparts, both in finite clauses (36) and infinitival wh-complements (37).

(36) Petja$_i$ skazal čto vesnoj on$_{i/j}$ poedet v Pariž
Petja said that spring he will-go.3.sg in Paris

‘Petja said that he will go to Paris in the spring’

(Livitz 2012:6)

(37) Petja$_i$ ne znaet čto (emu$_i$) skazat’ načal’niku
Petja NEG knows that he.DAT say.INF boss
‘Petja doesn’t know what he should tell his boss’

(Livitz 2012:6)

Livitz observes several similarities between these two kinds of constructions. For instance, in both cases the overt pronoun seems to be a simple pronominal which may or may not refer to the matrix subject, while the silent pronoun is referentially dependent on it. Livitz’s argumentation goes as follows. Since the two constructions in question share similarities and must have the same nature, and since, wh-infinitivals have been shown to be control constructions (Landau (2000); consequently, NPEC-sentences and control constructions (including ‘canonical’ control constructions, such as ‘I want to PRO quit’) are constructions of the same nature and must be accounted for in the same way. In other words, Livitz considers NPEC sentences a subclass of controlled constructions.
In order to account for these facts, Livitz develops a theory of defective goals, borrowing from Roberts (2010). Under this theory, defective goals are φ-deficient pronouns which agree with another DP in order to get its φ-features valued and are subject to deletion. Livitz proposes that both the NPEC and PRO of infinitival constructions are defective goals. This – quite straightforwardly – accounts for the free variation between overt and silent pronouns in the discussed constructions. In those constructions where the subject is overt, it enters the derivation with its φ-features valued; on the other hand, in the cases where the subject is silent, it enters the derivation with unvalued features, values them in the course of the derivation and then is deleted as a defective goal.

Here is how the derivation goes, step by step:

1. The embedded C – which has an uninterpretable feature bundle – agrees with its subject in its φ-features, the features, however, remain unvalued. The phase is extended since the features are not valued.
2. When a vP is merged, the v head, after having agreed with the subject in its specifier, values the embedded C and, subsequently, the embedded T. The embedded subject is deleted as a defective goal.

Below I will show that, firstly, this system overgenerates non-existing structures, and, secondly, that it fails to explain several properties of ATT-NPECs, most importantly, the complementizer condition and the ban on null copulas.
To show that Livitz’s system overgenerates, let’s once again list the conditions where, in Livitz’s system, we would expect a deletion of a defective goal. In order for a φP to delete, it must occupy the subject position, be adjacent to the C projection, and, additionally, the matrix verb must carry φ-features to evaluate the embedded C.
The first problematic point follows from the fact that the defective goal, in the present system, may bear different case from its antecedent, as the following example shows.

(38) Ja znaju [kuda (mne) poexat’]

I.NOM know where I.DAT go.INF
'I know where I should go'

It means, among other things, that the ungrammatical structures, where the NPEC in nondirective context bears a different case than its antecedent, like the following, must also be tolerated:

(39) On skazal, [čto *(emu) xolodno]
he said that he.DAT cold
'He said that he was cold'

(40) *Emu kazhetsja, [čto *(on) znaet otvet]
he.DAT seems that he.NOM knows answer
'He thinks that he knows the answer'

In addition to generating non-existing structures, Livitz's system also generates structures where silent pronouns can be licensed, but in which such pronouns must be LL-NPEC rather than ATT-NPEC, for example, in finite embedded clauses with a wh-word, as in (41):

(41) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen]
Misha tomorrow will.learn where was enrolled
'Misha will learn tomorrow when he was enrolled

Since defective goals are allowed in wh-infinitivals (see (37)), wh-words by themselves cannot block the agree relation.
Although this sentence is grammatical, Livitz's theory predicts that we should see evidence of a syntactic relation between a silent pronoun and its antecedent. As I showed in detail in section 2, this prediction is not borne out.

Again, as in the previous analysis, we are faced with the following dilemma. We can assume that Livitz's analysis is applicable only to ATT-NPEC, in which case the system would overgenerate. Alternatively, we can assume that Livitz's theory should take as its empirical domain all NPECs, in which case we have to conclude that system is not fine-grained enough to account for discrepancies found between ATT-NPECs and LL-NPECs. As I showed in section 2 such discrepancies are significant and difficult to ignore.

Livitz's system, like Tsedryk's account, also fails to explain why licensing of NPEC in embedded clauses is not possible in sentences with a null copula, such (42):

(42) Vova$_i$ skazal, [čto *(on$_i$) bogatyj]
Vova said that he rich.LF
'Vova said that he was rich'

To recall, defective goals are licensed in infinitival clauses where embedded predicates bear no inflection, which means that the valuation of features of the embedded subject must not be dependent on the presence of φ-features on the embedded predicate. This means that it is hardly conceivable that the absence of φ-features on the verb is what makes the sentence ungrammatical. Moreover, in Livitz's system the defective goal seems to be independent of the properties of the embedded predicate, which makes it hard to account for this constraint.

Another potential problem for the Livitz's analysis is the overt complementizer condition. Recall that NPECs are impossible whenever there is no phonological material in C. This position is very different from what we find in control constructions, where the C region does not contain any overt elements (in Russian). Thus there is no straightforward way to rule out (43), in Livitz's system:

(43) *Dima$_i$ skazal, [_$_i$ zajdët večerom]
Dima said will.come.over in.the.evening
'Dima said that he would come over in the evening'

Having discussed particular analyses, I will list several independent reasons against reducing NPEC of any kind to PRO.

First of all, it has been established in recent literature that control phenomena can be divided into two classes: logophoric control and predicative control (Landau 2015). Logophoric control is observed in complements of attitude verbs, while predicative control is observed in other environments such as sentential adjuncts. It is clear that the range of contexts where ATT-NPECs are observed is quite similar to that of logophoric control.

However, reducing the ATT-NPEC phenomena to logophoric finite control is still problematic. Firstly, controlled predicates, both finite and non-finite, always impose restrictions on the temporal interpretations of their complements, see Landau (2004); Grohmann (2003); Wurmbrand (2001); Todorović & Wurmbrand (2015), among others. This contrasts with ATT-NPEC clauses which are always free in their temporal interpretation.

Secondly, null subjects in finite control constructions never alternate freely with overt pronouns (apparent counterexamples involve focused PRO (see Szabolcsi (2009); Lee (2009); Landau (2015)), which is not the case in the discussed phenomenon.

Lastly, no language, to my knowledge, possesses logophoric finite control constructions while lacking predicative finite control.

All this does not strictly prove that NPEC sentences are not control constructions. However, positing that Russian NPEC-clauses are instances of finite control would mean that we have a highly typologically unusual kind of finite control, which has very different properties from established cases of finite control – a fact which is analytically undesirable.

Let's now summarize what has been discussed in this section. The relation between ATT-NPECs and their antecedent is clearly syntactic and shares many similarities with control, but reducing these phenomena to control is problematic. However, sentences with ATT-NPEC share many similarities with those with LL-NPEC where the syntactic nature of anaphoric relations is less obvious and which share less similarities to control.

5. Proposal

Before proceeding to the proposal, let's once again review the empirical data that we want to account for. We have seen that Russian can optionally drop subjects in clauses with overt complementizers. The silent pronouns found in these positions divide into two types: complements of attitude verbs and a more heterogenous class of adjuncts and embedded wh-sentences. In the first case the relation is purely syntactic. We also have seen that ATT-NPECs cannot be reduced to PRO despite the similarities of NPEC sentences and control structures. Finally, both phenomena can share several similarities, including the requirement on an overt complementizer and obligatoriness of inflection on the embedded predicate.

Below I will present an analysis, which can account for these facts. I will argue that in all NPEC-structures the subject position of the embedded clause is a minimal pronoun[9] with unvalued φ-features and an unvalued D feature. This pronoun is a clitic and must cliticize onto a phonologically overt projection on its left.

My main theoretical assumptions will be the following. I will adopt Holmberg's (2005), and Holmberg&Sheehan's (2010) idea that apart from φ-features null pronouns also bear a D feature. The inherent presence of a D feature is what distinguishes a referential pronoun from an impersonal one: all referential pronouns, by definition, must have its D feature valued by the end of the derivation.

This feature is argued to play an important role in accounting for the variation of the null subject parameter crosslinguistically. In consistent pro-drop languages, such as Italian, T has an unvalued D feature which can be valued as a result of agreeing with a topic position. In another group of languages, which the authors call partial pro-drop languages, T is assumed to be devoid of the D feature. In those languages null pronouns can be licensed only in the presence of a local antecedent[10].

I will assume that in Russian a minimal pronoun, a φP, enters the derivation with the following featural specifications: it is specified with unvalued φ-features and an unvalued D feature.

(44) Featural specification of φP: φP [uD: uφ:]

The pronoun enters the derivation with unvalued φ-feature and an unvalued D feature and needs to value them. In order to value its φ-features, the pronoun agrees with the finite verb, which – in most cases – enters the derivation with valued features. The only case when a finite verb in Russian bears no inflectional morphology, to my knowledge, is the case of a null copula. In those cases we can assume that the valuation goes in the opposite direction: the pronoun values the finite verb.

There are two important implications from this. Firstly, we now can account for the subjecthood of NPEC: since in Russian only subjects agree with verbs, no other argument but the subject can potentially value its φ-features via am agree relation. Secondly, it is clear that under this assumption, a φP cannot be licensed in a sentence with a null copula. In this way, the ungrammaticality of sentences like (45) is captured.

(45) Vova$_i$ skazal, [čto *(on$_i$) student]
Vova said that he student
'Vova said that he was a student'

Apart from bearing unvalued φ-features, a φP also bears an unvalued D feature. I assume that Russian T lacks a D feature, and the φP cannot value its D feature by agreeing with T. I will assume that for a language where T is not specified with a D feature there are two other ways a φP can get its feature valued: by entering a topic-chain or by agreeing with a C which, in its turn, agrees with a matrix vP. Let's consider each case separately.

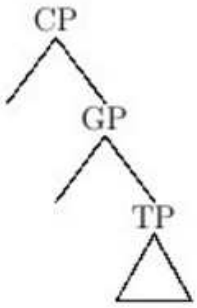
[9] I understand the notion 'minimal pronoun' in the sense of (Kratzer 2006) as a pronoun born without a complete set of features

[10] These languages share important similarities with Russian (see Tsedryk (2012) or Bizzarri (2015) for an overview), however, the detailed comparison of such languages with Russian is outside the scope of this paper.

Let's start with topic chains. Topic chains are a standard tool used to analyze pro-drop phenomena (See Frascarelli (2007) among others). Although details differ, the general idea behind this family of analyses is the following. In many consistent pro-drop languages, subjects of adjacent sentences in the discourse may move to the topic positions on the left periphery. These topic positions form a chain in which, by chain reduction, only the first copy is pronounced.

As argued by Frascarelli (2007), the only kind of topic position consistently present in embedded clauses is givenness topic position. I assume that in Russian there is a topic position designated for givenness. I follow Kučerová (2012) who observes that given elements in Russian always linearly precede new elements. She proposes that given elements are moved to the left periphery by a G(ivenness)-operator. I label the position where such elements move GP, although nothing crucial depends on this label. Importantly, this position is below the CP since given elements never precede the complementizer.

(46) The proposed structure of left periphery:



I depart from Holmberg&Sheehan (2010) in assuming that the (G-)topic-chain is a discourse, rather a syntactic phenomenon (although I will retain the term 'chain'). I propose that once an element has entered a topic chain, it can receive a D feature from linearly preceding elements of the chain. Crucially, this mechanism is not syntactic, which explains its ability to operate intersententially.

Postulating such mechanism is a stipulation but in many respects it is less problematic than the idea that DPs in a topic-chain are deleted by chain-reduction. Chain-reduction must resort to syntactic notions (Bobaljik 2002) while elements of a topic chain are often contained in different sentences, and no syntactic relation between them holds. In our system, transmission of D-feature within a topic chain is understood as a discourse phenomenon. I propose that D feature is transmitted with the same mechanism with which φ-features, viz., masculine gender and singular number, are transmitted from the antecedent, *Vova*, and the pronominal *on*, 'he', in example (47).

Another important point in which my analysis differs from Holmberg&Sheehan's is that in my analysis there is no reduction of the chain. More than one overt element can enter the chain (as long as their D-features match, see below) and there is no operation of reduction at any point. The nullness of the NPEC is due to the lexical property of the φP.

(47) <$_G$Vova> včera prixodil. <$_G$On> byl očen' rasstroen
Vova yesterday came.over he was very upset
'Vova came over yesterday. He was very upset'

The G-topic chain:
<Vova>; <on>

Let's now turn to phonological requirements on the φP. I assume φP to be a PF-clitic (in the sense of Bošković & Lasnik (2003)) which must have phonological material in the adjacent projection up (see similar proposals for null clitics in the C domain: Pesetsky (1991), Richards (1999), Landau (2008)). Since the GP is assumed to be adjacent to the CP the φP with all its features valued can now cliticize onto an adjacent higher projection given that there is phonologic material in the C area; otherwise the derivation crashes.

This system can, among other things, account for the fact that null pronouns are almost[11] never found in matrix clauses. Note that apart from the phonological requirement of the φP nothing else prevents φPs from appearing in matrix clauses on the condition that there is a sufficiently local referential antecedent. Since elements of a topic-chain can be sufficiently far from each other, the locality conditions are rather loose, as shown in (48):

(48) <$_G$**Saša$_i$**>	ne	znaet	čto	delat'	s	vazoj	kotoruju
Sasha	NEG	knows	that	do.INF	with	vase	which
< $_G$ _$_i$>	nakanune			polučil	v	podarok	
	the.day.before			got	in	gift	

'Sasha doesn't know what he should with the vase that he got as a present the day before'

However, once the chain is disrupted with a G-topic with another value of the D feature, the valuation is blocked:

(49) <$_G$**Saša$_i$**>	ne	znaet	čto	<$_G$**Nina$_j$**>	sdelala		s vazoj	kotoruju
Sasha	NEG	knows	that	Nina	do.INF		with vase	which
<$_G$_*i/j>	nakanune				polučila	v	podarok	
	the.day.before				got	in	gift	

'Sasha doesn't know what Nina did to the vase that she got as a present the day before'

Several questions arise at this point. First, why can't a φP enter a G-chain and value its features in the same way as in the previous case? The explanation of this fact may appeal to the principle of Intrasentential Coreference (Reinhart&Grodzinsky 1993), according to which coreference applies only when it is motivated. In our case, both mechanisms (the discourse mechanism and the syntactic mechanism) would yield the same results, so binding is preferred.

Let's now see how optionality is achieved. A clause can merge either a standard pronominal (or an R-expression) as subject position or a null φP. If the former option is chosen, the subject, being referential, does not need to value its D feature (it is assumed that DPs have their D feature inherently valued). Since such subjects are not clitics and are not phonologically

[11] The intricate properties and apparent discourse-sensitivity of pro-drop in matrix clauses suggest that a proper analysis of these facts must resort to discourse and semantics-pragmatics interface; such an analysis is outside the scope of this work. The same holds for peripherial adjunct clauses.

deficient, they may be licensed even in the absence of a complementizer, like in the following example:

(50) [[Jesli Dima$_i$ dejstvitel'no idët po toj ulice]
If he really walks along that street
on skoro uvidit stanciju]
he soon will.see station

'If Dima is really walking that street then he'll see the station soon'

Turning to complements of attitude verbs, recall that there is evidence that a null pronoun is bound with its antecedent via a syntactic relation. I propose that in these cases the subject position of the embedded clause is also occupied a φP. As in the case of LL-NPECs, this pronoun must value its φ-features from the finite verb and the pronoun must cliticize onto a higher projection which accounts for the no-null copula condition and the overt-complementizer condition.

Three major points in which ATT-NPECs are different from LL-NPECs are different are therefore the following: in these cases the subject is a bound variable, the subject can be controlled by a dative argument and the antecedent must be local. I want to argue that the first two conditions are due to the fact that the φP and its antecedent are bound by an agree relation. A persistent intuition that one might have when looking at ATT-NPEC clauses is that although they are referentially dependent, they are dependent on neither tense nor φ-features (unlike control constructions). Following this intuition, I argue that although an φP values its features clause-internally, it agrees with its D-features with the matrix clause. I will adopt Livitz's idea that an underspecified pronoun in the embedded clause agrees with the higher projection in order to get its features valued. However, I will assume that these two elements agree in D feature and not in φ-features. I will also assume, following Livitz, that the phase may extend when defective. As in the previous case, the φP enters the derivation with its D feature unvalued and, as in the previous case, it gets its from its antecedent. However, I propose that in this case the valuation goes indirectly, via a C head.

As we saw, the idea of agreement via the C head was adopted, among other works, in Livitz (2012). In the system presented here the driving force of this agree relation is a need for the subject of the embedded clause to value its D feature. Here is how the derivation goes, in more detail. The φP enters the derivation with φ-features and the D feature unvalued. The φP agrees with the finite verb of the embedded clause and gets its φ-features valued. To get its D-feature valued it needs to probe up. By the time the complementizer is merged the φP agrees with it. Now φP and the C head are in an agree relation but the D features of C are not valued. Once the matrix vP projection is merged, it can value the embedded C with the value of a D feature.

I assume that only the complementizer *čto* 'that' can bear the φ-feature and the D feature and thus mediate the agree relation. Wh-words cannot bear such features and thus the agreement with the matrix clause is blocked.

Let's now turn to the cases of addressee-oriented null pronouns. To recall, the ATT-NPEC can refer to the dative argument of the matrix predicate when this predicate is directive.

(51) Ja$_i$ skazal jemu$_j$, [čtoby _$_{*i/j}$ prixodil poskoree]
I said him SUBJ came soon

‘I told him to come soon’

A natural question which arises here is why antecedent is the dative argument and not the nominative. The problem is very reminiscent of the problem of the choice of the controller of PRO, which has been widely discussed (Landau 2013, Hornstein&Polinsky 2010). There is evidence, however, that the mechanism of the choice of the antecedent in these cases is independent from the mechanism of the derivation of the silent pronoun. Sentence (52) which is different minimally from (53) in having an overt pronoun instead of a null one, is ungrammatical, which suggests that irrespective of the properties of the subjunctive complement of the directive verb, its subject must be addressee-oriented.

(52) *Ja$_i$ skazal jemu$_j$, [čtoby ja$_j$ prixodil poskoree]
I said him SUBJ I came soon
int. ‘I told him that I should come’

(53) Ja$_i$ skazal jemu$_j$, [čto pridu zavtra]
I said him that will.com tomorrow
int. ‘I told him to come soon’

But saying just this is not enough. If we suggest that the agreement of the NPEC with an object is possible we have to account for the ungrammaticality of (54), in which the matrix predicate is not directive and the null pronoun is coreferential with the dative argument of the matrix clause. However, null pronouns cannot appear in non-directive contexts.

(54) *Ja$_i$ skazal jemu$_j$, čto pridët zavtra
I said him that will.com tomorrow
int. ‘I told him to come soon’

Since the structures of the matrix clauses in (51) and (54) seem to be identical, it is highly unlikely that we are dealing with a structural difference here that affects the antecedent choice. Instead, the following explanation can be proposed. Following Landau (2015), I assume that the C in the attitude contexts is endowed with an ‘author’ or an ‘addressee’ feature. Here, I depart from Landau’s proposal in assuming that the feature is encoded on the complementizer itself rather than projected as a pronoun in the SpecCP. This feature must match the φ-features and the D feature of the C in such a way that if they are inherited from a DP with a different feature, the derivation crashes. Directive verbs select for subjunctive complements which bear the ‘addressee’ feature (see Kempchinsky (2009)) for the account for this fact); in all other cases the complement with an ‘author’ feature is selected. It means that the embedded C can potentially agree with both the subject or the dative argument, and it is an independent mechanism that rules out one of those options in each case.

Here is how the distributional facts of ATT-NPEC-sentences are derived.

The locality condition follows from the locality of Agree relation (see for example Rackowski & Richards (2005)). In the cases where the null pronoun is contained in an adjunct clause the φP cannot value its D feature from the matrix clause because elements contained in matrix clauses are unavailable to Agree operations.
This analysis also has the following prediction: the pronoun and its syntactic antecedent cannot be separated by more than one phase boundary. This is indeed the case. In the following

example the null pronoun is separated from its syntactic antecedent by more than one phase boundary.

(55) Stëpa$_i$ pročital [prikaz generala$_j$, [čto *(on$_{i/j}$) poedet v drugoj gorod]]
Styopa read order general that he will.go in other city
'Stepa$_i$ read general's order that he$_i$ would go to another city'

In this sentence the silent pronoun is contained within a complex DP, and, in order to agree with the potential antecedent it needs to cross two phase boundaries.

I don't attempt to develop a semantic theory of null pronouns here, but I assume that boundness of null pronouns is achieved due the fact that they achieve their features as a result of a syntactic relation (see Reuland (2010)).

As we have seen, this theory can account for seemingly diverse phenomena once several assumptions are made. However, the theory also has some conceptual and empirical problems, which, as I hope, are not crucial but nevertheless deserve being mentioned. Let's start with conceptual points. First of all, the current analysis relies on the presence of a D feature. Such assumption is by no means novel (see, for example Holmberg (2005)), however, it remains problematic for several reasons. It is not quite clear what the value of this feature is. If this indeed is an indexical feature whose value is an index then it is not quite clear in what relation this feature might be with φ-features. Another important issue is the independent motivation for the D feature. If this feature is a syntactic feature number, gender etc. we would want do see morphological reflexes of this feature[12]

Secondly, it is unclear why the D feature can be intersententially transmitted only along the G-topic chain. Finally, since the theory of G-topic formation is not explicitly developed here it might leave many contrasts hardly falsifiable.

Turning to empirical issues the following must be mentioned. This account doesn't explain why silent pronouns in Russian are – under severe constraints – licensed in matrix clauses (more severe constraints and less regular patterns might suggest that we deal with a different phenomenon (see Haegeman (1990) on the so-called 'diary pro-drop' in English which might be a similar phenomenon)).

6. Impersonal pronouns as φP

In this section I briefly explore several implications the proposed account might have. In addition to two null referential pronouns, which distribution, as we have seen, is almost universally limited to embedded clauses, Russian has an impersonal null pronoun which can appear in matrix clauses quite freely.

(56) Zdes' ne l'ub'at čužakov
here NEG love.3PL foreighners
'Foreighers are unwelcome here'

[12] Although evidence for this might be found in sign languages, see Schlenker (2014)

It has been observed that these constructions have a following requirement: the null subject cannot occupy the leftmost position in the clause.

(55) *Ne l'ub'at zdes' čužakov
NEG love.3PL here foreigners
int.'Foreigners are unwelcome here.'

This constraint has been standardly analyzed as the EPP requirement of the T which cannot be satisfied by a null pronoun. I instead suggest that in this case we are dealing with the same pronoun we saw in embedded clauses (which is, however, devoid of the D feature) but that the motivation behind this requirement is different, namely that the silent pronoun in this case requires a phonological material in the next projection up thus reducing it to the same condition that prevents referential silent pronouns from. I will also assume that all referential DPs move to the SpecGP position while impersonal pronouns don't.

The pattern can be then explained in the following way. (55) is ruled out because the subject clitic fails to cliticize onto a higher projection. The adjacency requirement is crucial. When there is more than one projection between the clitic and its potential host, cliticization is blocked. One may wonder what happens if the clause like (55) is embedded under a complementizer, in (56):

(55) *On skazal [čto ne l'ub'at zdes' čužakov]
He said that NEG love here foreigners
int.'Foreigners are unwelcome here'

The ungrammaticality of this example might be problematic since one could say that the silent pronoun can cliticize onto the complementizer. I assume that cliticization in such cases is blocked because there is a G projection intervening between the null pronoun and the complementizer to which the φP cannot move because it is not referential, hence adjacency is not satisfied.

7. Conclusion

In this paper I argued that null pronouns in Russian embedded clauses should be categorized into two major subclasses. When embedded under attitude verbs NPECs participate in a close syntactic relation with their syntactic antecedent. In other cases, there is no evidence for a syntactic relation and the phenomenon seems to have non-syntactic nature. I argued that contrary to many claims, neither all NPECs nor the subclass found under attitudes can be reduced to PRO. An alternative analysis was proposed, according to which the NPECs are phonologically deficient minimal pronouns with unvalued φ-features and an unvalued D feature. The pronoun gets its φ-features valued from an inflected embedded verb, while the D feature must be valued by the antecedent, either directly or indirectly. Most empirical facts have been shown to be accounted for by the analysis.

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